

WHAT IS CLAIMED AS NEW AND DESIRED TO BE PROTECTED BY
LETTERS PATENT OF THE UNITED STATES OF AMERICA, IS:

1. Apparatus for applying tax stamps onto cigarette packages disposed within different cigarette cartons having different height dimensions, comprising:

5 a conveyor for serially conveying a plurality of different cigarette cartons having different height dimensions;

means for determining the particular height dimension of each one of the plurality of different cigarette cartons having different height dimensions;

10 a tax stamp applicator disposed at a cigarette package tax stamp application station; and

5016
A11
15 first means for automatically adjusting the elevational disposition of said tax stamp applicator at said cigarette package tax stamp application station in accordance with the height dimension data characteristic of a particular one of the plurality of different cigarette cartons being conveyed to said cigarette package tax stamp application station by said conveyor such that said tax stamp applicator is properly positioned with respect to the particular one of
20 the plurality of different cigarette cartons being conveyed to said cigarette package tax stamp application station by said conveyor so as to be capable of applying tax stamps to individual cigarette packages of the particular one of the plurality of different cigarette cartons when the particular
25 one of the plurality of different cigarette cartons is disposed at said cigarette package tax stamp application station regardless of the particular height dimension of the

particular one of the plurality of different cigarette cartons.

5

2. The apparatus as set forth in Claim 1, further comprising:

10 a programmable logic controller (PLC) operatively connected to said first means for automatically adjusting the elevational disposition of said tax stamp applicator at said cigarette package tax stamp application station;

15 a first sensor disposed at a cigarette carton height determination station for detecting the presence of the particular one of the plurality of different cigarette cartons at said cigarette carton height determination station and for transmitting a signal to said programmable logic controller (PLC) indicating the presence of the particular one of the plurality of different cigarette cartons at said cigarette carton height determination station; and

20 a second sensor disposed at said cigarette carton height determination station for determining the height dimension of the particular one of the plurality of different cigarette cartons present at said cigarette carton height determination station and for transmitting the height dimension data characteristic of the particular one of the plurality of different cigarette cartons present at said cigarette carton height determination station to said programmable logic controller (PLC) such that said programmable logic controller (PLC) can control said first means for automatically adjusting the elevational disposition of said tax stamp applicator at said cigarette package tax stamp applicator station.

25

30

cation station whereby said tax stamp applicator will be properly positioned with respect to the particular one of the plurality of different cigarette cartons when the particular one of the plurality of different cigarette cartons is disposed at said cigarette package tax stamp application station.

3. The apparatus as set forth in Claim 2, further comprising:

a cigarette carton opening station interposed between said cigarette carton height determination station and said cigarette package tax stamp application station, and comprising means for opening the particular one of the plurality of cigarette cartons so as to expose the cigarette packages contained within the particular one of the plurality of cigarette cartons in preparation for having tax stamps applied to the cigarette packages by said tax stamp applicator disposed at said cigarette package tax stamp application station; and

a cigarette carton closing station disposed downstream of said cigarette package tax stamp application station and comprising means for closing the particular one of the plurality of cigarette cartons after the cigarette packages of the particular one of the plurality of cigarette cartons has had tax stamps applied thereto by said tax stamp applicator disposed at said cigarette package tax stamp application station.

4. The apparatus as set forth in Claim 3, wherein:

said means, disposed at said cigarette carton opening station, for opening the particular one of the plurality of cigarette cartons, so as to expose the cigarette packages contained within the particular one of the plurality of cigarette cartons, comprises a pair of doming wheels for engaging side portions of the particular one of the plurality of cigarette cartons and thereby causing upper flap members of the particular one of the plurality of cigarette cartons to be domed upwardly, and a plow member for causing the upper flap members to be unfolded and extended outwardly with respect to each other; and

said means, disposed at said cigarette carton closing station, for closing the particular one of the plurality of cigarette cartons, comprises a glue pot and wheel for applying glue to one of the carton flap members, a pair of flap closers for folding the carton flap members in an overlapped mode with respect to each other, and a pressure plate and roller assembly for retaining the carton flap members in a folded state while the glue applied to the one of the carton flap members sets.

5. The apparatus as set forth in Claim 4, further comprising:

. second means operatively connected to said programmable logic controller (PLC) for automatically adjusting the elevational disposition of said doming wheels and plow member at said cigarette carton opening station in accordance with the height dimension data characteristic of the

particular one of the plurality of different cigarette cart-
ons disposed at said cigarette carton height determination
station, as the particular one of the plurality of cigarette
cartons is conveyed to said cigarette carton opening station
5 by said conveyor such that said doming wheels and plow mem-
ber are properly positioned with respect to the particular
one of the plurality of different cigarette cartons being
conveyed to said cigarette carton opening station by said
conveyor so as to be capable of opening the particular one
10 of the plurality of different cigarette cartons when the
particular one of the plurality of different cigarette cart-
ons is disposed at said cigarette carton opening station re-
gardless of the particular height dimension of the particu-
lar one of the plurality of different cigarette cartons; and
15 third means operatively connected to said program-
mable logic controller (PLC) for automatically adjusting the
elevational disposition of said glue pot and wheel, said
pair of flap closers, and said pressure plate and roller
assembly at said cigarette carton closing station, in ac-
20 cordance with the height dimension data characteristic of
the particular one of the plurality of different cigarette
cartons disposed at said cigarette carton height determina-
tion station, as the particular one of the plurality of ci-
garette cartons is conveyed to said cigarette carton closing
25 station by said conveyor such that said glue pot and wheel,
said pair of flap closers, and said pressure plate and roll-
er assembly are properly positioned with respect to the par-
ticular one of the plurality of different cigarette cartons
being conveyed to said cigarette carton closing station by
30 said conveyor so as to be capable of closing the particular
one of the plurality of different cigarette cartons when the

particular one of the plurality of different cigarette cartons is disposed at said cigarette carton closing station regardless of the particular height dimension of the particular one of the plurality of different cigarette cartons.

5

6. The apparatus as set forth in Claim 5, wherein:

10 said first means for automatically adjusting the elevational disposition of said tax stamp applicator at said cigarette package tax stamp application station, said second means for automatically adjusting the elevational disposition of said doming wheels and plow member at said cigarette carton opening station, and said third means for automatically adjusting the elevational disposition of said glue pot and wheel, said pair of flap closers, and said pressure plate and roller assembly at said cigarette carton closing station, respectively comprise first, second, and third

15 servo drive motors operatively connected to said programmable logic controller (PLC) for respectively receiving the height dimension data characteristic of the particular one of the plurality of different cigarette cartons.

20

25

7. The apparatus as set forth in Claim 3, wherein:

said cigarette carton height determination station, said cigarette carton opening station, said cigarette package tax stamp application station, and said cigarette carton closing station are all equally spaced apart from

30 each other by a first predetermined distance; and

5 said conveyor for serially conveying the plurality
of different cigarette cartons, having different height di-
mensions, comprises a plurality of pusher members equally
spaced apart from each other by a second predetermined dis-
5 tance which is equal to said first predetermined distance
comprising the spacing apart of said cigarette carton height
determination, said cigarette carton opening, said cigarette
package tax stamp application, and said cigarette carton
closing stations such that when a first one of said plurali-
10 ty of pusher members has conveyed a first one of the plural-
ity of different cigarette cartons, having different height
dimensions, to said cigarette carton closing station, a sec-
ond one of said plurality of pusher members has conveyed a
second one of the plurality of different cigarette cartons,
15 having different height dimensions, to said cigarette pack-
age tax stamp application station, a third one of said plu-
rality of pusher members has conveyed a third one of the
plurality of different cigarette cartons, having different
height dimensions, to said cigarette carton opening station,
20 and a fourth one of said plurality of pusher members is dis-
posed at said cigarette carton height determination station
in preparation for conveying a fourth one of the plurality
of different cigarette cartons, having different height
dimensions, to said cigarette carton opening station.

25

8. The apparatus as set forth in Claim 1, further compris-
ing:

means for holding a roll of tax stamp paper upon which a predetermined row and column array of tax stamps is disposed;

5 said tax stamp applicator disposed at said cigarette package tax stamp application station comprises a plurality of longitudinally spaced stamping shoes for engaging predeterminedly spaced ones of the tax stamps disposed in the predetermined array of rows and columns upon the roll of tax stamp paper; and

10 said tax stamp applicator is linearly longitudinally movable, with respect to said cigarette package tax stamp application station and in predetermined incremental steps, such that said longitudinally spaced stamping shoes can engage predetermined sets of the predeterminedly spaced
15 tax stamps each time said tax stamp applicator is incrementally moved one step whereby a predetermined number of the plurality of different cigarette cartons can have tax stamps from the rows of tax stamps disposed upon the tax stamp paper applied to their cigarette packages before the tax
20 stamp paper must be advanced so as to present new rows of tax stamps of the row and column array of tax stamps to said stamping shoes of said tax stamp applicator.

25

9. A method of applying tax stamps onto cigarette packages disposed within different cigarette cartons having different height dimensions, comprising the steps of:

30 providing a conveyor for serially conveying a plurality of different cigarette cartons having different height dimensions;

determining the particular height dimension of each one of the plurality of different cigarette cartons having different height dimensions at a height determination station;

5 providing a tax stamp applicator at a cigarette package tax stamp application station; and

10 automatically adjusting the elevational disposition of said tax stamp applicator at said cigarette package tax stamp application station in accordance with the height dimension data characteristic of a particular one of the plurality of different cigarette cartons conveyed to said cigarette package tax stamp application station by said conveyor such that said tax stamp applicator is properly positioned with respect to the particular one of the plurality of different cigarette cartons being conveyed to said cigarette package tax stamp application station by said conveyor so as to be capable of applying tax stamps to individual cigarette packages of the particular one of the plurality of different cigarette cartons when the particular one of the plurality of different cigarette cartons is disposed at said cigarette package tax stamp application station regardless of the particular height dimension of the particular one of the plurality of different cigarette cartons.

25

10. The method as set forth in Claim 9, further comprising the steps of:

30 providing cigarette carton opening means, at a cigarette carton opening station interposed between said cigarette carton height determination station and said cigarette

package tax stamp application station, for opening the particular one of the plurality of cigarette cartons so as to expose the cigarette packages contained within the particular one of the plurality of cigarette cartons in preparation
5 for having tax stamps applied to the cigarette packages by said tax stamp applicator disposed at said cigarette package tax stamp application station; and

providing cigarette carton closing means, at a cigarette carton closing station disposed downstream of said
10 cigarette package tax stamp application station, for closing the particular one of the plurality of cigarette cartons after the cigarette packages of the particular one of the plurality of cigarette cartons have had tax stamps applied thereto by said tax stamp applicator disposed at said cigarette package tax stamp application station.
15

504
11. The method as set forth in Claim 10, further comprising
20 the steps of:

automatically adjusting the elevational disposition of said cigarette carton opening means at said cigarette carton opening station in accordance with the height dimension data characteristic of the particular one of the
25 plurality of different cigarette cartons disposed at said cigarette carton height determination station, as the particular one of the plurality of cigarette cartons is conveyed to said cigarette carton opening station by said conveyor such that said cigarette carton opening means are
30 properly positioned with respect to the particular one of the plurality of different cigarette cartons being conveyed

to said cigarette carton opening station by said conveyor so
as to be capable of opening the particular one of the plu-
rality of different cigarette cartons when the particular
one of the plurality of different cigarette cartons is dis-
posed at said cigarette carton opening station regardless of
the particular height dimension of the particular one of the
plurality of different cigarette cartons; and
automatically adjusting the elevational disposi-
tion of said cigarette carton closing means at said ciga-
rette carton closing station in accordance with the height
dimension data characteristic of the particular one of the
plurality of different cigarette cartons disposed at said
cigarette carton height determination station as the partic-
ular one of the plurality of cigarette cartons is conveyed
to said cigarette carton closing station by said conveyor
such that said cigarette carton closing means are properly
positioned with respect to the particular one of the plural-
ity of different cigarette cartons being conveyed to said
cigarette carton closing station by said conveyor so as to
be capable of closing the particular one of the plurality of
different cigarette cartons when the particular one of the
plurality of different cigarette cartons is disposed at said
cigarette carton closing station regardless of the particu-
lar height dimension of the particular one of the plurality
of different cigarette cartons.

12. The method as set forth in Claim 11, further comprising
the steps of:
providing each one of said cigarette carton open-

ing means disposed at said cigarette carton opening station,
said cigarette package tax stamp applicator disposed at said
cigarette package tax stamp application station, and said
cigarette carton closing means disposed at said cigarette
5 carton closing station with first, second, and third servo
drives; and

operatively connecting a programmable logic con-
troller (PLC), into the memory of which has been entered the
particular height dimension of each one of the plurality of
10 different cigarette cartons having the different height di-
mensions thereof determined at said height determination
station, to said first, second, and third servo drives of
said cigarette carton opening means disposed at said ciga-
rette carton opening station, said cigarette package tax
stamp applicator disposed at said cigarette package tax
15 stamp application station, and said cigarette carton closing
means disposed at said cigarette carton closing station for
controlling the automatic elevational adjustment of said ci-
garette carton opening means disposed at said cigarette
carton opening station, said tax stamp applicator disposed
20 at said cigarette package tax stamp application station, and
said cigarette carton closing means disposed at said ciga-
rette carton closing station in accordance with the height
dimension data characteristic of the particular one of the
25 plurality of different cigarette cartons disposed at said
cigarette carton height determination.

30 13. The method as set forth in Claim 12, further comprising
the steps of:

equally spacing said cigarette carton height determination station, said cigarette carton opening station, said cigarette package tax stamp application station, and said cigarette carton closing station apart from each other
5 by a first predetermined distance; and

providing said conveyor, for serially conveying the plurality of different cigarette cartons having the different height dimensions, with a plurality of pusher members equally spaced apart from each other by a second predetermined distance which is equal to said first predetermined distance comprising the spacing apart of said cigarette carton height determination, said cigarette carton opening, said cigarette package tax stamp application, and said cigarette carton closing stations such that when a first one
10 of said plurality of pusher members has conveyed a first one of the plurality of different cigarette cartons, having the different height dimensions, to said cigarette carton closing station, a second one of said plurality of pusher members has conveyed a second one of the plurality of different cigarette cartons, having the different height dimensions, to said cigarette package tax stamp application station, a third one of said plurality of pusher members has conveyed a third one of the plurality of different cigarette cartons, having the different height dimensions, to said cigarette carton opening station, and a fourth one of said plurality of pusher members is disposed at said cigarette carton height determination station in preparation for conveying a fourth one of the plurality of different cigarette cartons, having the different height dimensions, to said cigarette carton opening station.
15
20
25
30

14. The method as set forth in Claim 13, further comprising the step of:

operatively connecting said conveyor to said programmable logic controller (PLC) such that said programmable logic controller (PLC) can control the movement of said conveyor through means of a predetermined distance which is equal to said first and second predetermined spaced distances defined between said cigarette carton height determination station, said cigarette carton opening station, said cigarette package tax stamp application station, and said cigarette carton closing station, and defined between said conveyor pusher members, respectively.

15. The method as set forth in Claim 9, further comprising the steps of:

providing a paper roll holder for holding a roll of tax stamp paper upon which a predetermined row and column array of tax stamps is disposed;

providing a plurality of longitudinally spaced stamping shoes upon said tax stamp applicator disposed at said cigarette package tax stamp application station for engaging predeterminedly spaced ones of the tax stamps disposed in the predetermined array of rows and columns upon the roll of tax stamp paper; and

linearly longitudinally moving said tax stamp applicator, with respect to said cigarette package tax stamp application station and in predetermined incremental steps, such that said longitudinally spaced stamping shoes can engage predetermined sets of the predeterminedly spaced tax

stamps each time said tax stamp applicator is incrementally moved one step whereby a predetermined number of the plurality of different cigarette cartons can have tax stamps from the rows of tax stamps disposed upon the tax stamp paper applied to their cigarette packages before the tax stamp paper must be advanced so as to present new rows of tax stamps of the row and column array of tax stamps to said stamping shoes of said tax stamp applicator.

10

15

20

25

30